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# EXISTENCE OF SOLUTIONS TO SYSTEMS OF SECOND-ORDER IMPULSIVE DIFFERENTIAL EQUATIONS WITH INTEGRAL BOUNDARY CONDITIONS ON THE HALF-LINE

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**Abstract.** By using a vector version of Krasnosel'skii's theorem and a technique based on vector-valued norms, the authors investigate the existence of solutions to a system of second-order impulsive differential equations with integral boundary conditions on the half-line.

**Keywords.** Impulsive differential equations, systems of equations, infinite interval, integral boundary conditions, Krasnosel'skii's fixed point theorem, vector-valued norm, convergent to zero matrix.

**AMS (MOS) subject classification:** 34A37, 34B15, 34B37, 34B40.

## 1 Introduction

The theory of boundary-value problems with integral boundary conditions for ordinary differential equations arises in different areas of applied mathematics and physics. For example, heat conduction, chemical engineering, underground water flow, thermo-elasticity, and plasma physics can be reduced to nonlocal problems with integral boundary conditions. In recent years, the theory of ordinary differential equations and integro-differential equations on an infinite interval with impulses has become a new important branch of investigation (see for example, [4, 8, 10, 12, 20] and the reference therein).

Boundary value problems with integral boundary conditions on the half line for different classes of systems of differential equations have been intensively studied in the literature using a variety of methods (see [5, 6, 17, 18]).